

U.S. Patent Application Serial No. 10/527,699

Response filed September 1, 2006

Reply to OA dated June 2, 2006

**AMENDMENTS TO THE CLAIMS:**

Please amend claims 1, 4, 5-10, 19 and 20, as follows. This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (Currently Amended): A catalyst composition comprising a crosslinked organic polymer compound and a palladium catalyst, wherein said catalyst is physically carried on said crosslinked organic polymer compound, prepared by

homogenizing a straight chain organic polymer compound having a crosslinkable functional group, and the palladium catalyst in a solvent dissolving said straight chain organic polymer compound;

then depositing the composition formed; and

subjecting a crosslinkable functional group in said deposited composition to a crosslinking reaction.

Claim 2 (Original): The composition according to Claim 1, wherein the palladium catalyst is Pd(0) or a salt of Pd(II).

Claim 3 (Original): The composition according to Claim 2, wherein Pd(0) has no ligand.

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Claim 4 (Currently amended): The composition according to Claim 1, wherein the crosslinked organic polymer compound is:

a crosslinked product of a polymer or a copolymer obtained by polymerizing or copolymerizing 1) at least one ~~kind of a~~ monomer having a crosslinkable functional group and a polymerizable double bond, or

a crosslinked product of a copolymer obtained by copolymerizing 1) at least one ~~kind of a~~ monomer having a crosslinkable functional group and a polymerizable double bond and 2) at least one ~~kind of a~~ monomer having a polymerizable double bond.

Claim 5 (Currently Amended): The composition according to Claim 4, wherein the crosslinked organic polymer compound is a crosslinked product of a copolymer obtained by copolymerizing :

1) two ~~kinds of~~ monomers having a crosslinkable functional group and a polymerizable double bond and

2) one ~~kind of a~~ monomer having a polymerizable double bond.

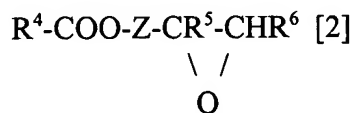
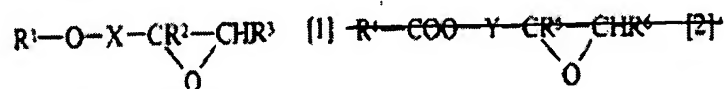
Claim 6 (Currently Amended): The composition according to ~~Claims~~ Claim 4 or 5, wherein the crosslinkable functional group is an epoxy group, a carboxyl group, a hydroxyl group, an acyloxyl group, an isocyanato group or an amino group.

Claim 7 (Currently Amended): The composition according to ~~Claims~~ Claim 4 or 5, wherein ratio of a monomer unit derived from a monomer having a crosslinkable functional group and a polymerizable double bond is 0.1 to 100% based on all monomer units in the whole copolymer before crosslinking of the crosslinked organic polymer compound.

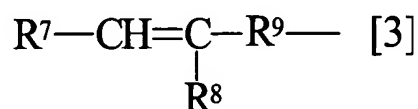
Claim 8 (Currently amended): The composition according to Claim 4, wherein :

1) the monomer having a crosslinkable functional group and a polymerizable double bond is represented by :

(1) a glycidyl compound having an epoxy group as a crosslinkable functional group, selected from the group consisting of a glycidyl ether ~~or~~ and a glycidyl ester represented by the following general formula formulas [1] ~~or~~ and [2], respectively,

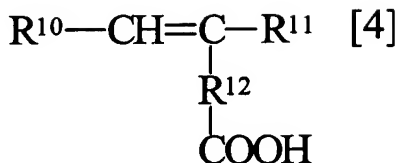


(wherein R<sup>2</sup>, R<sup>3</sup>, R<sup>5</sup> and R<sup>6</sup> each independently represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; X and [[Y]] Z each independently represents an alkylene group having 1 to 6 carbon atoms; R<sup>2</sup> may form a ring of 3 to 6 members together with carbon atoms of R<sup>3</sup> or X, and R<sup>5</sup> may form a ring of 3 to 6 members together with carbon atoms of R<sup>6</sup> or [[Y]] Z; and R<sup>1</sup> and R<sup>4</sup> each independently is a group represented by the following general formula [3]:



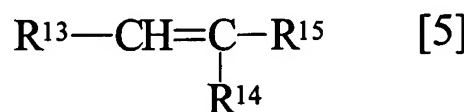
[wherein R<sup>7</sup> and R<sup>8</sup> each independently represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; R<sup>9</sup> represents a direct-linkage, an alkylene group having 1 to 6 carbon atoms, an arylene group having 6 to 9 carbon atoms, an arylalkylene group having 7 to 12 carbon atoms or an arylenealkylene group having 7 to 15 carbon atoms; and an aryl, arylene, arylenealkylene or arylenealkylene group may have an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms and/or a halogen atom, as a substituent]);

(2) a monomer having a carboxyl group as a crosslinkable functional group, represented by the following general formula [4]:



(wherein R<sup>10</sup> represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; R<sup>11</sup> represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an aryl group having 6 to 10 carbon atoms or an aralkyl group having 7 to 12 carbon atoms; ~~and an~~ , wherein the aromatic ring in the ~~above~~ aryl group or aralkyl group may have an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms and/or a halogen atom as a substituent; and R<sup>12</sup> represents a direct-linkage, an alkylene group having 1 to 6 carbon atoms, an arylene group having 6 to 9 carbon atoms, an arylalkylene group having 7 to 12 carbon atoms or an arylenealkylene group having 7 to 15 carbon atoms); and

(3) a monomer having a hydroxyl group, an acyloxy group, an isocyanato group or an amino group as a crosslinkable functional group, represented by the following general formula [5]:

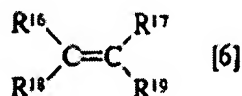


(wherein R<sup>13</sup> represents a hydrogen atom or an alkyl group having 1 to 20 carbon atoms; R<sup>14</sup> represents a hydroxyl group, an amino group, hydroxyalkyl group having 1 to 50 carbon atoms that may have a carbonyl group and/or an oxygen atom, a hydroxyaryl group having 6 to 10 carbon atoms, a hydroxyaralkyl group having 7 to 50 carbon atoms that may have a carbonyl group and/or

an oxygen atom, a hydroxyalkylaryl group having 7 to 50 carbon atoms that may have a carbonyl group and/or an oxygen atom, an acyloxy group having 2 to 6 carbon atoms, an arylacyloxy group having 7 to 15 carbon atoms, an isocyanatoalkyl group having 2 to 7 carbon atoms, an isocyanatoaryl group having 7 to 20 carbon atoms, an isocyanatoaralkyl group having 8 to 20 carbon atoms, an isocyanatoalkylaryl group having 8 to 20 carbon atoms, an aminoalkyl group having 2 to 7 carbon atoms, an aminoaryl group having 7 to 20 carbon atoms, an aminoaralkyl group having 8 to 20 carbon atoms or an aminoalkylaryl group having 8 to 20 carbon atoms; an aromatic ring in the above hydroxyaryl group, hydroxyaralkyl group, hydroxyalkylaryl group, arylacyloxy group, isocyanatoaryl group, isocyanatoaralkyl group, isocyanatoalkylaryl group, aminoaryl group, aminoaralkyl group and aminoalkylaryl group may have an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms and/or a halogen atom; R<sup>15</sup> represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an aryl group having 6 to 10 carbon atoms or an aralkyl group having 7 to 12 carbon atoms, ~~and an~~ wherein the aromatic ring in the ~~above~~ aryl group or aralkyl group may have an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms and/or a halogen atom, as a substituent), and

2) the monomer having a polymerizable double bond is represented by the general formula

[6]:



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(wherein R<sup>16</sup> and R<sup>17</sup> each independently represent a hydrogen atom or an alkyl group having 1 to 6 carbon atoms; R<sup>19</sup> represents a hydrogen atom, a halogen atom or an alkyl group having 1 to 6 carbon atoms; R<sup>18</sup> represents a carboxyl group, a hydroxyl group, an acyloxy group having 2 to 6 carbon atoms, an arylacyloxy group having 7 to 15 carbon atoms, an alkoxycarbonyl group having 2 to 6 carbon atoms, an alkyl group having 1 to 6 carbon atoms, an aryl group having 6 to 10 carbon atoms and an aralkyl group having 7 to 12 carbon atoms; an aromatic ring in the above arylacyloxy group, aryl group and aralkyl group, may have further an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms or a halogen atom, as a substituent).

Claim 9 (Currently amended): The composition according to Claim 8, wherein :

one ~~kind of the~~ monomer having a crosslinkable functional group and a polymerizable double bond is a glycidyl ether represented by the general formula [1]; and

the other ~~kind thereof is a~~ monomer having a crosslinkable functional group is a monomer represented by the general formula [4] containing a carboxyl group, as a crosslinkable functional group, or a monomer represented by the general formula [5] containing a hydroxyl group as a crosslinkable functional group.

Claim 10 (Currently Amended): The composition according to Claim 8, wherein at least one ~~kind of monomers~~ monomer having a crosslinkable functional group and a polymerizable double

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bond represented by the general formulas [1], [2], [4] and [5], and monomers having a polymerizable double bond represented by the general formula [6], is one having an aromatic ring.

Claim 11 (Original): The composition according to Claim 8, wherein all of monomers having a crosslinkable functional group and a polymerizable double bond represented by the general formulas [1], [2], [4] and [5], and of monomers having a polymerizable double bond represented by the general formula [6], are those having an aromatic ring.

Claim 12 (Original): The composition according to Claim 8, wherein in a monomer containing a hydroxyl group as a crosslinkable functional group, represented by the general formula [5], R<sup>14</sup> is a straight chain hydroxyalkyl group having 1 to 50 carbon numbers, which may contain an oxygen atom.

Claim 13 (Original): The composition according to Claim 4, wherein in the crosslinked organic polymer compound, the shortest number of atoms of crosslinked portion existing between an alkylene chain derived from a polymerizable double bond and another alkylene chain derived from a polymerizable double bond is 1 to 400.

Claim 14 (Original): The composition according to Claim 1, wherein the crosslinked organic polymer compound is that obtained by crosslinking a copolymer of :



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- (1) a glycidyl compound having an epoxy group and a polymerizable double bond;
- (2) a styrene type monomer; and
- (3) an acrylic acid type monomer or a monomer containing a hydroxyalkyl group having at least one oxygen atom and a polymerizable double bond.

Claim 15 (Previously Presented): The composition according to Claim 14, wherein the monomer of (3) in the crosslinked organic polymer compound is a copolymer of a monomer having a hydroxyalkyl group containing at least one oxygen atom and a polymerizable double bond.

Claim 16 (Original): The composition according to Claim 14, wherein :

the glycidyl compound having an epoxy group and a polymerizable double bond is vinylbenzyl glycidyl ether or vinyl phenylglycidyl ether;

the styrene type monomer is styrene or methylstyrene;

the acrylic acid type monomer is an acrylic acid or a methacrylic acid; and

the monomer containing a hydroxyalkyl group having at least one oxygen atom and a polymerizable double bond is tetraethylene glycol monomethacryloyl ester or tetraethylene glycol mono-2-phenyl-2-propenyl ether.

Claim 17 (Original): A method for producing the composition according to Claim 1, characterized in that :

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a straight chain organic polymer compound having a crosslinkable functional group, and a palladium catalyst are homogenized in a solvent which dissolves said straight chain organic polymer compound;

followed by depositing the composition produced; and

subjecting a crosslinkable functional group in said deposited composition to a crosslinking reaction.

Claim 18 (Original): The method for production according to Claim 17, wherein the palladium catalyst is a complex with triphenylphosphine, tri-t-butylphosphine, triethylphosphine, or trimethylphosphine.

Claim 19 (Currently amended): A method for performing a substitution reaction at an allyl position, characterized in that an allyl carbonate and a nucleophilic agent are reacted in the presence of the composition according to Claim 1 to form a compound where the carbon nucleophilic agent substitutes at carboxyl ester position of the allyl carbonate.

Claim 20 (Currently amended): A method for performing an oxidization reaction of an alcohol, characterized in that the composition according to Claim 1 is reacted with an alcohol to form a ketone compound corresponding to the alcohol.